



H2/F
PATENT APPLICATION
Do. No. 5484-048

OCT 29 2002

TECHNOLOGY CENTER 2800

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Byung-Sup SHIM, et al

Serial No. 09/305,240

Examiner: Nadav, Ori

Filed: May 4, 1999

Group Art Unit: 2811

For: OPEN DRAIN INPUT/OUTPUT STRUCTURE AND MANUFACTURING
METHOD THEREOF IN SEMICONDUCTOR DEVICE

BOX NON FEE AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

RESPONSE TO OFFICE ACTION

Responsive to the Office Action, dated July 15, 2002, please amend the application as follows.

IN THE CLAIMS

5. (Thrice Amended) A pull-up transistor disposed between a Vdd terminal and an I/O pad of a semiconductor device comprising:

- a semiconductor substrate of a first conductivity type;
- a source region and a drain region of a second conductivity type formed in the substrate and defining between them a channel region, one of the source region and the drain region being electrically coupled to the I/O pad, the other one of the source region and the drain region being electrically coupled to the Vdd terminal;
- an impurity implantation region of impurities of a second conductivity type formed in a first sector of the channel region, the first sector not reaching either one of the source region and the drain region;
- the impurity implantation region of the first sector comprising a surface region of the second conductivity type as a depletion channel;
- a second sector of the channel region exclusive of the first sector comprising a uniform doping concentration of the first conductivity type and a surface region of the first conductivity type as an enhancement channel;